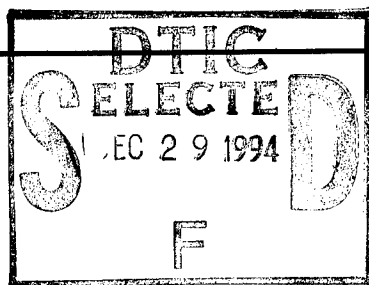




US Army Corps  
of Engineers  
Waterways Experiment  
Station



Soil Mechanics Information

**SMIAC**  
Analysis Center

Volume 95-1

November 1994

## Construction Productivity Advancement Research

A revolutionary program to help the U.S. construction industry improve productivity and regain its competitive edge nationally and internationally was begun in 1989 under the direction of the Assistant Secretary of the Army (Civil Works). The Construction Productivity Advancement Research (CPAR) Program is a cost-shared partnership among the Corps of Engineers and the U.S. construction industry, state and local governments, academic institutions, and other groups to facilitate research, development, and application of advanced technologies through cooperative research and development, field demonstrations, licensing agreements, and other forms of commercialization and technology transfer. Two important new Cooperative Research and Development Agreements (CRDA) for microtunneling and horizontal directional drilling are highlighted in this issue.

### In This Issue

- Construction Productivity Advancement Research
- Fail-Safe Microtunneling
- Horizontal Directional Drilling Beneath Levees
- The Defense Technical Information Center
- Recent Publications

This document has been approved  
for public release and sale; its  
distribution is unlimited.

A Department of Defense Information Analysis Center

The SMIAC bulletin is published and distributed periodically. Please contact the Director of SMIAC for more information:

Director, Soil Mechanics Information Analysis Center  
U.S. Army Engineer Waterways Experiment Station  
ATTN: CEWES-GV-Z  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199

Phone: (601) 634-3376  
FAX: (601) 634-3139

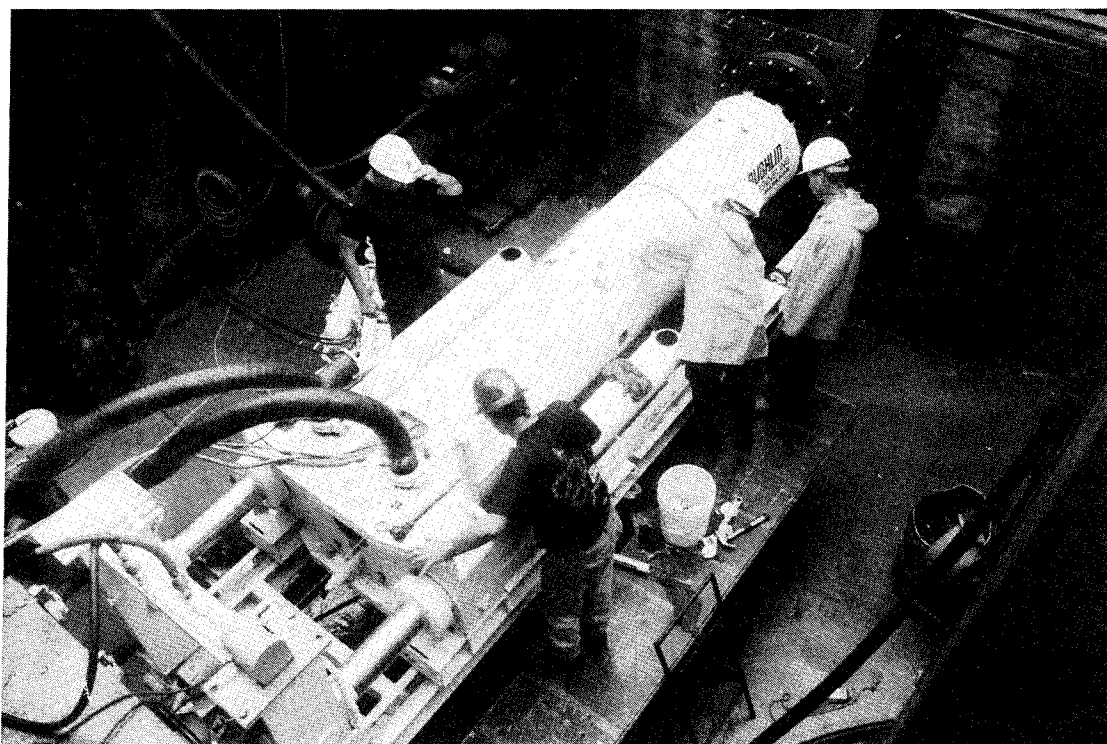
DTIC QUALITY INSPECTED 1

19941223 034

# Fail-Safe, Retrievable Microtunneling

Industry and laboratory partners have signed a Cooperative Research and Development Agreement (CRDA) to demonstrate, evaluate, and gain commercial acceptance of an innovative, fail-safe, retrievable microtunneling system that is ideally suited for environmental restoration and other critical projects where surface access is severely limited (drives under highways, airport runways, or railroad tracks). Features that set this microtunneling system apart include the versatility to handle practically any ground conditions by the use of temporary high strength steel pipes during the jacking process, a reamer system that allows the installation of a variety of product pipe diameters, and a provision for successful retraction in the event

that unexpected conditions are encountered. This particular method has been successfully demonstrated in Europe. The U.S. Army Engineer Waterways Experiment Station (WES) has teamed up with McLaughlin Manufacturing Company, Greenville, SC, and Markham & Company, Ltd., Chesterfield, England, to evaluate the performance of the system under a variety of known, controlled ground conditions at WES's extensively instrumented Trenchless Technology Test Facility. The results are expected to provide U.S. owners, designers, and contractors the justification and documentation they need to specify and use the system in the United States.



**Microtunneling system undergoing evaluation at WES' Trenchless Technology Test Facility**

# Horizontal Directional Drilling Beneath Levees

The U.S. Army Engineer Waterways Experiment Station has teamed with O'Donnell Associates, Inc., Sugar Land, TX, to develop guidelines for installing pipelines beneath rivers and within levee rights-of-way using horizontal directional drilling (HDD) techniques. The Cooperative Research and Development Agreement (CRDA) is expected to demonstrate that these techniques offer substantial economic and operational advantages over current practices. A two phase program is designed to investigate hydraulic forces, determine the effect of the drilling fluid, establish techniques for eliminating undesirable fluid returns, and develop guide specifications. The first phase includes development of a conceptual model to evaluate machine-ground interaction and stability problems using numerical modeling methods. Various ground conditions, geometries, and machine opera-

tional characteristics will be considered. Findings are to be validated during the second phase where subsurface pressures will be monitored during actual drilling beneath inactive levee sections. Industry participation will be derived from individual pipeline and utility companies who have expressed an interest, and industry associations that include the American Gas Association's Pipeline Research Committee (AGA-PRC), the Gas Research Institute (GRI), the Directional Crossing Contractor's Association (DCCA), and the North American Society for Trenchless Technology (NASTT). The elimination of features normally required in construction and maintenance of levee and adjacent road crossings (bridges, concrete boxes, earthen cover, and ramps) is expected to save the pipeline industry millions of dollars.

## Come to DTIC for the Answers to Your Needs

By: Ms. Denise Mahalek

Program Analyst, Defense Technical Information Center

The Defense Technical Information Center (DTIC) is a provider of scientific, technical, and engineering information services to U.S. Government agencies, their contractors, subcontractors, and potential contractors. We play an important role in managing this information for our user community and have the expertise to handle the most complex requests.

Through an impressive collection of products and services, we have become the most complete source of Defense-related information in the United States. From easy-to-use online systems to print and nonprint products, we have something for virtually every organization. Designed to meet all budgets and research needs, DTIC's products and services come in many formats, cover all subject areas of interest to DoD, are timely, and inexpensive! Here's just a sample of what we can offer you:

### DTIC's Online Services

- *Defense Research, Development, Test & Evaluation Online System (DROLS)* provides online access to DTIC's three databases (Technical Report (TR) Bibliographic Database, Research and Technology (R&T) Work Unit Information System, and Independent Research & Development Database). The user's personal computer is linked to DTIC's central computer system for easy, up-to-date access to DROLS or a user may request DTIC's Reference and Retrieval staff do the search for them.

*Technical Report (TR) Bibliographic Database* is a collection of nearly 2 million bibliographic records and abstracts of completed print and printout products submitted to DTIC, such as technical reports, DoD patent applications, conference papers, theses, soft-

A-1	
Special	

ware, data files, databases, and videos. Classified, limited, and unclassified reports are available to qualified users.

*Research & Technology (R&T) Work Unit Information System (WUIS)* is a collection of ongoing DoD research and technology efforts at the work unit level submitted to DTIC. WUIS answers the questions of what, where, when, how, at what cost, and by whom research is being performed. This database also includes NASA efforts.

*Independent Research and Development (IR&D) Database* contains descriptions of research and development efforts currently performed by U.S. Government contractors. Access is limited to DoD personnel and other federal agencies with the approval of DoD. Online access to this proprietary data can only be accommodated through the use of a classified terminal or via a STU-III.

- *Department of Defense Gateway Information System (DGIS)* offers convenient access to over 1,000 commercial and governmental databases. DGIS is a key component in DTIC's efforts to provide the Defense community with access to vital information. You also get instant access to the Internet at no additional cost!

## **DTIC's Database Products and Services**

- *Current Awareness Products* give you automatic access to core DoD research and development efforts at a very low price.

*Automatic Document Distribution (ADD) Program* provides bimonthly automatic distribution of microfiche copies of newly accessioned scientific and technical reports in accordance with a user defined profile. The *Automatic Hardcopy Document Distribution (AHDD) Program* offers this same service in paper copy format.

*Current Awareness Bibliography (CAB) Program* is a customized, automated subscription bibliographic service based on a user's subject needs. The user's subject interest profile is matched against newly acquired accessions in the TR Bibliographic Database. The end product is a technical report bibliography sent to the user on a semi-monthly basis.

*Recurring Reports Program* matches a user's profile against newly acquired information in the WUIS or IR&D databases. It can be supplied monthly, quarterly, semi-annually, or annually, according to user preference. The end product contains management summaries which match a user's interests. Information included depends on the summary format selected.

- *Technical Report Database on CD-ROM* is a subscription product containing nearly 700,000 unclassified citations taken from the TR Bibliographic Database, which were entered into DTIC's collection from January 1970 to the present. Each quarterly update includes citations to an additional 3 months of newly acquired material. Users have convenient access to technical report citations at their personal computers.

DTIC's customer support staff is available to serve your needs. For information on registering with DTIC or for additional information on our products and services, please contact the Product Management Branch on (703) 274-6434, or DSN 284-6434, or write to the Defense Technical Information Center, DTIC-BCP, Building 5, Cameron Station, Alexandria, Virginia 22304-6145. Make the most of every dollar and opportunity. Call DTIC today and tell us what you need! We are here to serve you.

## Partial Listing of Recent Geotechnical Laboratory Publications

<i>Report No.</i>	<i>Date</i>	<i>Title</i>	<i>NTIS AD Number</i>
TR GL-94-11	04/94	Determination of Soil Moduli in Soil-Structure Systems on Highways	A280211
TR GL-94-13	04/94	Archaeological Geophysics Investigation of the Wright Brothers 1910 Hanger Site: Wright-Patterson Air Force Base, Ohio	A279955
TR GL-94-14	05/94	Geomorphic and Sedimentation Investigation of the 15 June 1991 Eruption of Mt. Pinatubo, The Philippines	A280960
TR GL-94-16	05/94	Post Eruption Hydrology and Hydraulics of Mt. Pinatubo, The Philippines	A281068
TR GL-94-17	04/94	Force Projection Site Investigation Using the Electric Cone Penetrometer (ECP) and the Dynamic Cone Penetrometer (DCP)	A282441
TR GL-94-23	08/94	A Waterborne Seismic Reflection Survey of the Inner Bar Channel and Anchorage Basin, Galveston, Texas	
TR GL-94-25	08/94	Automated Transportation Network Extraction Techniques from Digital Multispectral Imagery	
TR GL-94-28	08/94	A Waterborne Seismic Reflection Survey of Three Tributaries in Boston Harbor, MA	
TR GL-94-29	08/94	Normalization and Prediction of Geotechnical Properties Using the Cone Penetrometer Test (CPT)	
MP GL-93-19	08/93	Proceedings, Workshop on Prediction of Groundwater Flow into Deep Tunnels and Excavations	A270529
MP GL-94-18	05/94	Installation of Vertical Strip Drains to Increase Storage Capacity of Craney Island Dredged Material Management Area	A282682
MP GL-94-28	07/94	Case Study: Leaking Groundwater Monitor Well Casing	A283316
REMR-GT-16	11/93	Redevelopment of Relief Wells, Upper Wood River Drainage and Levee District, Madison County, Illinois	A273845
DRP-94-1	04/94	Hydraulically Transported Clay Balls	A280413
DRP-94-3	06/94	Descriptors for Granular Bottom Sediments to be Dredged	

*The reports listed above having AD numbers can be obtained from: National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161; telephone (703)487-4650. Please refer to the listed AD number. For those reports that do not have AD numbers, the report can be obtained from WES at (601)634-2571.*



The *SMIAC Bulletin* is published in accordance with AR 25-30 as one of the information exchange functions of the Corps of Engineers. The purpose of the bulletin is to rapidly and widely disseminate information to other Corps offices, U.S. Government agencies, and the engineering community in general. The bulletin does not promulgate Corps policy. The contents of this bulletin are not to be used for advertising or promotional purposes, nor are they to be published without proper credit. Any copyrighted material released to and used in *The SMIAC Bulletin* retains its copyright protection and cannot be reproduced without permission of the copyright holder. *The SMIAC Bulletin* will be issued periodically. Communications are welcomed and should be made by writing to the U.S. Army Engineer Waterways Experiment Station, ATTN: David Haulman (CEWES-GV), 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, or calling (601) 634-3376.

ROBERT W. WHALIN, PhD, PE  
Director

OFFICIAL BUSINESS  
CEWES-GV-Z

DEPARTMENT OF THE ARMY  
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS  
3909 HALLS FERRY ROAD  
VICKSBURG, MISSISSIPPI 39180-6199

BULK RATE  
U.S. POSTAGE PAID  
Vicksburg, MS  
Permit No. 85